**Public Account Committee – Supporting innovation to deliver net zero**

**Introduction to MoltexFLEX and the FLEX reactor**

MoltexFLEX is a British advanced nuclear technology company developing a unique and patented molten salt reactor (MSR) in the UK. The FLEX reactor is a new class of advanced modular reactor that provides clean, low-cost, reliable electricity and high-quality heat at ~750°C. The FLEX reactor uses two molten salts – one as a fuel, and one as a coolant. Both salts operate at low pressure – making the reactor inherently much safer than conventional technologies and avoiding the expensive steel and concrete structures and control systems that are required to ensure safety in traditional reactors. Its size and modular design means that components can be made in factories, and onsite construction and assembly work is significantly reduced, leading to fast build times.

Transformative change, as opposed to incremental improvement, typically results from a change in technology. Advanced nuclear technologies (ANTs) such as the FLEX reactor offer transformative changes to the cost of nuclear energy and flexibility in its uses, as well as making it rapidly globally deployable.

**Ask of Government**

MoltexFLEX is calling on the Government to provide confidence to the private sector to invest in the development of a wider array of nuclear technologies in the ambitious but achievable pursuit of delivering ANTs, working towards the goal of nuclear sources providing 25% of projected demand for electricity by 2050. MoltexFLEX’s target is to develop its MSR in the UK by 2029, but a significant challenge is attracting private investment for ongoing development.

These investors require strong signals that regulatory engagement will be supported and encouraged throughout the development lifecycle, and that support will be provided to deploy demonstrator units, secure first commercial sites, and later facilitate international commercialisation.

MoltexFLEX is privately funded, and therefore is not replying to this inquiry regarding the £4.2 billion investment into net zero, but rather to give views on how and why the Government should foster an environment which attracts and incubates investment in potentially transformative technologies.

**The value for money proposition of ANTs and the FLEX reactor**

It is cheaper to achieve the scale benefits of nuclear energy by building multiple small modular reactors over GW-scale reactors. ANTs like the FLEX reactor are designed from the ground up to be low cost. The simplicity of the FLEX reactor design in particular enables disruptively lower costs. The FLEX reactor will produce electricity at a cost comparable to offshore wind, at just £30 per MWh, compared to around £100/MWh at Hinkley Point C.

There are other advantages as well: ANTs require much less space than large-scale reactors and, as such, can be built on the sites of decommissioned fossil fuel plants and former industrial sites. In turn, this distribution of energy production helps reduce the burden on the national grid infrastructure.

The challenge facing ANT developers lies primarily in accessing and completing the lengthy regulatory and planning processes associated with bringing transformative technologies to commercialisation. It is therefore crucial that the Government signals a commitment to ANTs in the UK and provides a funding horizon beyond the upcoming first round of the Great British Nuclear (GBN) SMR competition.

**Reflections on the National Audit Office report into support for innovation to deliver net zero.**

***“To achieve its net zero objectives the government depends on innovations gaining commercial viability, but the Delivery Plan only covers government support up to the end of the commercial prototype stage.”***

We agree that the UK has an undeniable strength in early-stage discovery and development, and an R&D system that is highly competitive worldwide. We also agree that the design of policy mechanisms for later stage development is significantly less competitive and needs to be enhanced.

Nuclear technology development offers huge potential for all the reasons we have set out, but it is also a high-risk activity. Beyond the inherent risks of new technology R&D are risks associated with regulatory, planning and development timescales. As such, the Government needs to provide more support during this phase. This includes investment in the expertise required to provide effective policy and regulatory support – including providing more resources to the Office for Nuclear Regulation (ONR), to make it easier for ANT providers at the prototype stage to engage with the regulator.

The Government has put significant impetus on developing advanced nuclear technology, and MoltexFLEX welcomes this, but there has been too much emphasis on one type of ANT. Government support for High Temperature Gas Reactors (HTGRs) has been interpreted by some investors as the UK’s ‘selection’ despite the Government’s open statements that it has no specific technology preference. This situation is stifling the ability of innovative companies like ours to gain commercial viability. MoltexFLEX would like to see the Government consider and provide public support for a wider array of nuclear technologies in its pursuit of its 2050 energy ambition. To be clear, this does not mean financing technology development, but rather establishing enabling mechanisms for technologies to be quickly demonstrated and proven.

***“In addition to direct funding to support early-stage research and innovation, the government aims to create a policy environment and regulatory framework which incentivises further deployment of new technologies. Private companies may also be encouraged to invest, for example through the tax credits system, although departmental data do not break down how much of this might be ascribed to research and development on net zero activities.”***

MoltexFLEX welcomes this recommendation; on top of this, MoltexFLEX believes that the creation of GBN has the potential to incentivise the further deployment of new technologies. As the GBN SMR competition progresses, MoltexFLEX asks that the Government ensure that regardless of what priorities are established during the first round of the competition, it is made clear that privately financed ANTs are wanted in the UK, and that there is a clear route to commercial delivery. Otherwise, investors will exit the UK market.

A commercial delivery route should include clarity on siting, consenting, operations and offtake arrangements. ONR needs to be supported in developing the resources to engage with these technology vendors. GBN can support this by explicitly stating during the current consultation that plans include one or more ANT development site(s).

With regards to tax credits, MoltexFLEX recently submitted a response to the R&D Tax Reform Consultation. In the submission, it was argued that the development of the FLEX reactor so far has stemmed from R&D efforts, and that further progress relies on R&D and tax relief. Although large, well-established businesses can also drive innovation, they can more often afford to fund R&D efforts off their balance sheets. However, many SMEs are financially restricted, and cash credits amplify their available financial resources and can help accelerate the development of their ventures. A scheme that prioritises SMEs will benefit their internal management, attract investors, and help provide a stable cash flow.

**Conclusion**

Countries at the forefront of net zero innovation will be providers to the international market. The global export opportunities for the FLEX reactor are significant, with potential markets such as UAE, Poland, Finland, Brazil, India and Egypt.

Overall, greater certainty is needed in the policy and regulatory frameworks in highly regulated sectors like nuclear energy to ensure the UK does not renege on its legally binding commitment to reach net zero by 2050 and can capitalise on significant commercial export opportunities.